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Smart Mirror technology and its impact in luxury fashion retail and customer's purchase decision: A TAM approach

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Master's in Management

Supervisor:

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Iscte – Instituto Universitário de Lisboa

October, 2024



BUSINESS
SCHOOL

Department of Marketing, Operations and General Management

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Resumo

Este estudo versa sobre o impacto da tecnologia de Espelho Inteligente na experiência de retalho de moda de luxo, focando-se nos seus efeitos na satisfação do cliente e nas suas intenções de compra. Utilizando o Modelo de Aceitação de Tecnologia (TAM) como estrutura, esta pesquisa avalia os principais fatores que influenciam a adoção do Espelho Inteligente, incluindo a percepção de facilidade de uso, utilidade percebida, apelo estético e navegação. Foi realizado um inquérito entre consumidores de luxo, cujos resultados indicam que a navegação e a utilidade percebida são preditores significativos de satisfação que, por sua vez, impulsiona a intenção de compra. Em contrapartida, o apelo estético demonstrou um impacto menor na satisfação do que o esperado. Estas conclusões destacam a importância de conceber Espelhos Inteligentes intuitivos e funcionais para melhorar as experiências em loja no retalho de moda de luxo, aumentando, assim, o envolvimento dos clientes e o potencial de vendas.

Palavras-chave: Espelho Inteligente, retalho de moda de luxo, experiência do cliente, satisfação do cliente, inovação digital no retalho.

Códigos JEL: L81 (Retail and Wholesale Trade; e-Commerce), L67 (Other Consumer Nondurables: Clothing, Textiles, Shoes, and Leather Goods; Household Goods; Sports Equipment)

Abstract

This study examines the impact of Smart Mirror technology on the luxury fashion retail experience, focusing on its effects on customer satisfaction and purchasing intentions. Employing the Technology Acceptance Model (TAM) as a framework, this research evaluates key factors influencing Smart Mirror adoption, including perceived ease of use, perceived usefulness, aesthetic appeal, and navigation. A survey was conducted among luxury consumers, with findings indicating that navigation and perceived usefulness are significant predictors of satisfaction, which in turn drives purchase intention. Conversely, aesthetic appeal showed a lesser impact on satisfaction than expected. These insights highlight the importance of designing intuitive and functional Smart Mirrors to improve in-store experiences in luxury fashion retail, ultimately boosting customer engagement and sales potential.

Keywords: Smart Mirror, luxury fashion retail, customer experience, customer satisfaction, digital innovation in retail.

JEL Codes: L81 (Retail and Wholesale Trade; e-Commerce), L67 (Other Consumer Nondurables: Clothing, Textiles, Shoes, and Leather Goods; Household Goods; Sports Equipment)

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Glossary

AR	Augmented Reality
AVE	Average Variance Extracted
PLS	Partial Least Squares
SEM	Structural Equation Modelling
TAM	Technology Acceptance Model
VIF	Variance Inflation Factor
VR	Virtual Reality

1. Introduction

Retail stores remain a very important touchpoint for consumers, particularly in a luxury setting (Aiolfi & Sabbadin, 2019). In fact, prior to COVID-19, physical stores were responsible for more than 90% of luxury sales (Harba, 2019). While the pandemic temporarily shifted consumer behavior, the majority of luxury fashion transactions are still in brick-and-mortar stores today. Additionally, most luxury shoppers prefer to visit brands' physical stores, and they believe stores should display a higher level of digital integration (Business of Fashion; Royalmount, 2023).

Despite the rise of e-commerce, luxury fashion has remained cemented on the physical store throughout the years. Thus, and to meet the customers' ever-changing needs and expectations, luxury fashion brands were faced with the challenge of creating unique concepts and experiences for them, and technology very often plays a crucial part in this process. The modern luxury consumer demands a seamless integration of online and offline elements within the shopping journey (Harba, 2019). The blending of physical and digital dimensions has become key for brands that want to improve their retail spaces and providing an elevated experience for their customers.

In luxury fashion, emotions play a pivotal role in driving consumer purchases, whether for clothing, accessories or jewelry. The emotional gratification derived from self-pleasure and indulgence remains one of the most significant motivators for luxury shoppers (Aleem et al., 2022). In this sense, technology is being used by companies to reshape the retail industry by enabling brands to create more immersive and appealing shopping experiences.

Over the last decades, technology has undoubtedly revolutionized the way people live, interact, and engage with the world, and this rapid evolution presents both challenges and opportunities for governments, consumers, and companies globally. As technology continues to progress, its influence will most likely continue to grow within various industries, including luxury retail. Considering the strong emphasis on value and exclusivity in luxury fashion – providing unique, high-quality products and personalized experiences to their customers – decision-makers need to be constantly updated on emerging technologies, as these hold the potential to help brands succeed in establishing an emotional bond with their consumers. This personalization and attention to detail is critical, as consumers expect experiences that reflect the luxury products they seek. For instance, nowadays Virtual Reality (VR) and Augmented Reality (AR) enable luxury brands to

create tailored and interactive environments that do not require major physical alterations to pre-existing stores (Harba, 2019).

This thesis aims to understand the impact that emerging technologies, specifically Smart Mirrors, have in luxury fashion retail. It seeks to explore how this technology influences both the overall customer experience and their purchasing decisions. Initially, the research will focus on reviewing and analyzing the current literature on luxury fashion, retail, and consumer, and the role of technology within physical retail spaces. Thus, the present thesis intends to fulfill the following objectives:

- 1) To understand and synthesize the specificities of luxury fashion retail and the growing importance of digitalization;
- 2) To assess the impact of Smart Mirror technology on the customer's retail experience;
- 3) To examine the effects of Smart Mirror technology on the customer's decision-making process regarding their purchases.

2. Literature Review

2.1. Luxury, luxury brand, and luxury fashion brand definitions

The term Luxury derives from the Latin word “luxus”, which refers to indulgence, extravagance, eccentricity, and imposingness (Merriam-Webster, n.d.). It also shares some roots with the term “luxuria”, which refers to excess, opulence, and lustfulness (Castelli, 2013). However, there is no universal definition of luxury, particularly given the subjective nature of the concept and its dependence on the social, economic, and cultural context in which it is being defined. In other others, the perception of what luxury means is highly influenced by time and context and has evolved throughout history (Makkar & Yap, 2018; Cabigiosu, 2020).

Similarly, there is no universal definition of a luxury brand. For authors like Ko et al. (2019), to be considered luxurious, a brand needs to offer products or services that are perceived by the consumers as being of superior quality while offering value through functional and emotional benefits. Furthermore, a luxury brand must have a prestigious and distinguished resemblance among the consumers, usually by showcasing characteristics like the craftsmanship it takes to construct their garments and other products, or reinforcing the time the product takes to be made or the service delivered (Aleem et al., 2022; Fionda & Moore, 2009). By doing so, brands reinforce their value and luxury fashion consumers are more prone to pay a bigger amount for a product which they perceive to indicate status (Aleem et al., 2022).

Serdari (2020) further contributes to defining luxury brands by adding the dimension of timeless value and durability, stating that a luxury brand needs to represent an assurance of future value. The author also mentions that luxury implies a ubiquitous scarcity, allure and culture, which adds appeal to a brand (Fionda & Moore, 2009), as well as creating experiences with emotional, physical, cultural and intellectual ramifications.

Even though there are brands undoubtedly established as luxury fashion brands, such as Channel, Dior, Fendi, Cartier, Loewe, Prada, Schiaparelli, or Bottega Veneta, there is no universal definition of luxury fashion. However, most definitions share some common features: high prices, rarity, and a sense of indulgence (Faier, 2015; Fionda & Moore, 2009). It also entails the perception of the product being fabricated with exceptional materials, with a high level of artistry, technique (Dhaliwal et al., 2020; Lee et al., 2020; Aleem et al., 2022), and an arduous production process, which results in a long-lasting product whose appeal last for years and years (Faier,

2015). Some authors also mention the need of connection between luxury and experience and services, and a high symbolic value (Cabigiosu, 2020). Authors like Aiolfi and Sabbadin (2019) add features like status signaling, excellence, scarcity, allegorical meaning that create emotional bonds with the consumer.

Others define luxury fashion by separating the concept into a product perspective and consumption perspective. The first refers to the excellence in quality, high transaction price, distinctiveness, scarcity, and skillfulness. On the other hand, the latter relates to the fulfilment of psychological needs and the purchasing experience, more connected with hedonic consumption (Fionda & Moore, 2009).

2.2.Luxury Fashion Retail and Luxury Consumer

Luxury customers seek personal satisfaction and an emotional component when shopping, as their consumption has a hedonistic dimension which should be fulfilled (Cabigiosu, 2020), challenging luxury fashion brands to not focusing solely on the products, but also on the experience of acquiring it (Faiers, 2015). Therefore, it's important that brands place a heavy focus on creating unique and memorable experiences for their customers, making the memory of the shopping experience part of the products themselves (Sachdeva & Suhsma, 2015).

The ambience and service provided by luxury brands in their physical stores are key aspects of the luxury proposition (Fionda & Moore, 2009), and most high-end fashion brands already make efforts to promote a service of excellence to ensure that the customer is pleased with their purchase, but also with the experience of doing so (Loeb, 2022). Hence, most luxury retailers strive to create an architectural space that conveys a sense of opulence (Fionda & Moore, 2009), and work with sales assistants that guide customers through the brand's portfolio of luxury goods. In fact, sales assistants play a crucial role in building long-lasting relationships with customers, as they know information such as their sizes and, most importantly, their taste (Loeb, 2022; Kim & Kim, 2014). Thus, luxury physical spaces are key to a company's reputation, and luxury brands frequently own stores to better control the customer relationship and experience with the brand (Cabigiosu, 2020; Fionda & Moore, 2009).

In the current paradigm, retail success is not just about what a brand is selling, but how they are doing it, especially considering the emotional component of luxury purchasing (Sachdeva & Suhsma, 2015). Even though sales assistants have been a staple in luxury fashion retailing, their work can be complemented by technology, especially considering that today's consumers require fast-paced, interactive and immersive experiences, ideally, tailored to their individual preferences (Harba, 2019).

Luxury consumers expect brands to know them, their likes and dislikes, their taste and thus, to have experiences that are adapted to these features (Harba, 2019). Thus, experiential retail emerges with a strong impact, giving retail stores the potential to contribute to the customer's perception of value and to influence their purchasing process (Aleem et al., 2022). Furthermore, technology has a significant role on the consumers' expectations, which pressures brands to deliver a flawless and tailored experience throughout the brand's channels – online and offline.

2.3. Technology in luxury fashion retail and Smart Mirror

Technologies like the Smart Mirror provide the opportunity for brands to better present their products, and to tailor the experience for each consumer. On the other hand, it allows customers to be connected to the store and have an engaging experience (Aiolfi & Sabbadin, 2019)

Integrating offline and online is a necessity for retailers nowadays, allowing them to maximize the potential of the physical space and to provide a more intricate and dazzling shopping experience. Technologies based on artificial intelligence are among the most common and are redesigning the retail atmosphere and how customers interact with the store and the brand (Aleem et al., 2022).

Brands can take advantage of technologies like VR and AR to create an unlimited number of unique experiences personalized to each customer. They have the possibility to upgrade their storytelling capabilities by creating stories and letting their consumers immerse themselves in those narratives and become a part of them, enabling the consumer to further establish an emotional bond with the brand (Harba, 2019). Brands now face the challenge of transforming the physical space to an experiential one (Aiolfi & Sabbadin, 2019; Harba, 2019). When a brand succeeds in

this transformation, consumers become more involved with the brand, which then leads to a higher predisposition to pay the premium price (Aleem et al., 2022).

Across published literature, there are multiple designations of the Smart Mirror, such as Virtual Fitting Room (Beck & Cri , 2018; Werdayani & Widiaty, 2021), Magic Mirror (Xue et al., 2022; Ahmed et al., 2023), Smart Mirror Fashion Technology (Dongare et al., 2020; Wang et al., 2023), or Interactive Mirror (Ogunjimi et al., 2021). Its main and most common feature is displaying product information, such as available colors, sizes, inventory, and even complementary products to foster cross-selling (Prakash et al., 2020). Some characterize it as a contemporary way of trying on clothes without having to wear them (Prakash et al., 2020; Wang et al., 2023), specially with Smart Mirrors that have a hidden camera behind the glass that allows customers to position themselves in front of the mirror and try the outfit and/or take a selfie to post on social media.

Finally, the Smart Mirror may also allow customers not only to quickly and comfortably browse for clothing items through the mirror's screen but can also foster their imagination to create unique looks with the guidance of the store's sales assistant (Wang et al., 2023), creating meaningful experiences for the customers and helping them make decisions with more confidence (Ogunjimi et al., 2021).

3. Conceptual model and hypothesis development

This thesis aims to assess the influence of the Smart Mirror technology on the retail experience in a luxury setting, specifically its impact on customer satisfaction and purchasing behavior. To study this relationship between the Smart Mirror and the consumer, TAM was the chosen methodology.

The TAM, initially developed in 1986 by Fred Davis, aims to evaluate the reasons that lead to technology acceptance or rejection among users. TAM centers around two main variables with a mediating role: *perceived usefulness* and *perceived ease of use* (Davis, 1989). Since it was first developed, the model has been subjected to many variations, however, it is still the most common approach to study user acceptance of technology (Marangunic & Granic, 2015). Given the increasing integration of technologies in retail, applying TAM in this context allows for an understanding of how consumers perceive and interact with Smart Mirrors, particularly in terms of ease, utility, and overall shopping experience.

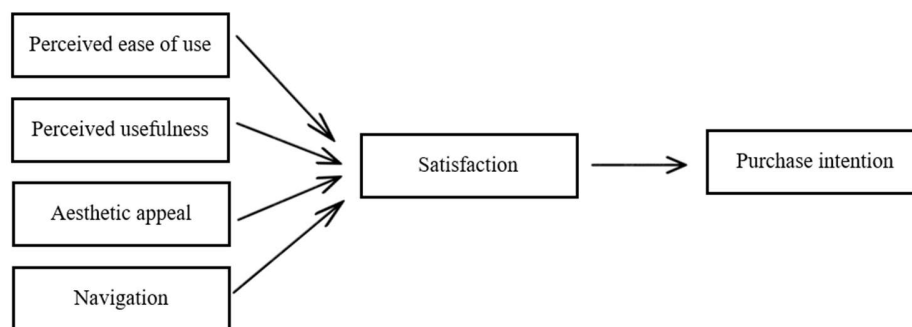


Figure 1 - Conceptual model

3.1. Perceived ease of use and Perceived usefulness

According to Davis (1989), perceived ease of use and perceived usefulness are key factors influencing the acceptance or rejection of a technology by consumers. The author defined perceived usefulness as “the degree to which a person believes that using a particular system would improve his or her job performance” and perceived ease of use as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p. 320). These constructs are particularly relevant in the retail context, where ease of interaction and functional benefits may directly impact consumer satisfaction and willingness to engage with new technologies. We can then make an assumption that a technology such as the Smart Mirror that is

easy to use and considered useful will likely positively influence consumers' shopping experience, and thus, it can be hypothesized:

H₁ – Perceived ease of use positively influences consumers' satisfaction when interacting with Smart Mirrors.

H₂ – Perceived usefulness positively influences consumers' satisfaction when interacting with Smart Mirrors.

3.2. Aesthetic appeal

Secondly, perceived aesthetic appeal refers to the degree to which consumers find Smart Mirrors in stores visually attractive (Park et al., 2021). In luxury retail, focusing on aesthetics is crucial, as visually sophisticated environments can increase customer engagement and improve their experience. Furthermore, some studies suggest that digital technologies with strong visual appeal can improve the customer's experience, brand engagement, as well as the customer's experience and their aspiration to purchase (Schweiger et al., 2020; Aleem et al., 2022).

Smart Mirrors provide an opportunity for brands to diversify sensory experiences lived by consumers in their retail stores (Park et al., 2021; Castillo & Bigne, 2021). Considering the strong focus on visual sophistication in luxury settings, we can theorize that visually appealing user interfaces like Smart Mirrors can lead to consumers being more likely to positively engage with the technology, and consequently increasing their satisfaction with the retail experience. Thus, it can be hypothesized that:

H₃ – Aesthetic appeal positively influences consumers' satisfaction when interacting with Smart Mirrors.

3.3. Navigation

Navigation comprises the journey of interacting with technology like Smart Mirrors, and it allows customers to search for product-related information or complementary products. Navigation is then a part of the customer's experience, and they are more likely to value technologies that have an effective navigation system (Castillo & Bigne, 2021). In luxury retail, where customers expect a seamless shopping experience, the significance of navigation becomes even higher.

Companies need to be cautious with the design and implementation of the navigation systems for Smart Mirrors, as too complex layouts may frustrate the customers and make them leave without purchasing any items (Loureiro, 2023). An effective navigation system not only makes it easier to access the desired information, but also fosters a sense of engagement. We can speculate that technologies like Smart Mirrors that have an effective navigation system where customers can easily access the information they desire will improve their experience with the retail experience. Thus, it can be hypothesized that:

H₄ – Navigation influences consumers' satisfaction when interacting with Smart Mirrors.

3.4.Satisfaction

Luxury is highly connected to experiences and services, and it is associated with a symbolic value, which then influences the customer to be more willing to spend lavish amounts of money (Cabigiosu, 2020). Consequently, the retail shopping experience is an essential aspect for luxury consumers and brands can use it to increase customer's satisfaction by creating value for them and, therefore, influencing their decision-making process (Aleem et al., 2022). In this context, the immersive and interactive nature of technologies like Smart Mirrors can significantly improve the retail experience, allowing customers to engage with products in innovative ways. Furthermore, customer satisfaction can lead to a positive influence on future purchase intentions, whereas a dissatisfaction may lead to the opposite (Carpenter, 2008). We can then make the assumption that a customer who is more satisfied with their retail experience will be more likely to have a higher purchase intention. Thus, it can be hypothesized that:

H₅ – Customers' satisfaction with their experience using Smart Mirrors influences their purchasing intention.

4. Methodology

4.1. Sample and data collection

To collect data, a questionnaire created in Google Forms was shared online, and the responses were considered from the 1st of May to the 30th of June. The questionnaire aimed to measure six variables: perceived usefulness, perceived ease of use, aesthetic appeal, navigation, satisfaction and purchase intention. These variables were determined considering their importance to study the role of a Smart Mirror in luxury physical spaces.

To ensure reliability, an inclusion criterion considered a question about the respondents purchasing habits, namely if the respondent had purchased a luxury item good or visited a luxury fashion store within the last 12 months, and only these respondents were then considered in the analysis. For this study, the following luxury brands were considered: Burberry, Fendi, Balenciaga, Dolce & Gabbana, Ralph Lauren, Cartier, Valentino, Loewe, Armani, Coach, and Max Mara.

The survey starts with a 30-second video with the purpose of providing a clear understanding of the technology in the retail context, as well as to simulate a real scenario with the technology. After the video, the respondents are presented with a set of questions to answer regarding each mentioned variable.

4.2. Demographic profile

The analysis included 105 valid responses. Among the respondents, 54.29% were female, 44.76% were male, and 0.95% classified as other; 38.10% were between 25-34 years old, 25.71% were between 35-44 years old, 19.05% were between 45-54 years old, and people over 55 years old represent the remaining 17.14%. Regarding income level, 25.71% of the respondents earned between 20,000 and 24,999 euros, 21.90% earned between 25,000 and 29,999 euros, 16.19% earned between 30,000 and 34,999 euros, 14.29% earned between 30,000 and 34,999 euros, and the remaining 21.90% are split between 4 other ranges (see Table 1).

Table 1 - Demographic characteristics

Variables	Frequency (N=105)	Percent
Gender		
Male	47	44.76%
Female	57	54.29%
Other	1	0.95%
Age		
18-24	7	6.67%
25-34	40	38.10%
35-44	27	25.71%
45-54	20	19.05%
55-64	9	8.57%
+65	2	1.90%
Annual Income		
< 11,000 euros	4	3.81%
11,000 – 14,999 euros	9	8.57%
15,000 – 19,999 euros	15	14.29%
20,000 – 24,999 euros	27	25.71%
25,000 – 29,999 euros	23	21.90%
30,000 – 34,999 euros	17	16.19%
35,000 – 39,999 euros	7	6.67%
40,000 – 44,999 euros	3	2.86%

4.3. Variables and measurement

All variables were measured using 5-point Linkert-type scales, limited between 1 (Strongly Disagree) and 5 (Strongly Agree). Perceived ease of use and perceived usefulness were measured using four and three items, respectively, that were adapted from Tzou and Lu (2009) and Song and Jo (2023). The three items used to measure the aesthetic appeal were adapted from Park et al. (2021). Navigation was measured using four items that were adapted from Castillo and Bigne (2021). Satisfaction was measured using four items adapted from Carpenter (2008) and, lastly, 3 items were used to measure purchase intention, adapted from Riedel and Mulcahy (2019) (See Annex 9.1).

4.4. Statistical analysis

To test the chosen conceptual framework, Structural Equation Modelling (SEM) was used, specifically, through the Partial Least Squares (PLS). Data was analyzed using SmartPLS 3

software (Ringle, M. et al., 2024), following a two-stage process. Initially, the reliability and validity of the measurement model was assessed, followed by an evaluation of the structural model.

To evaluate the quality of the measurement model, four indicators were individually tested: reliability, convergent validity, internal consistency reliability, and discriminant validity. Results indicated that the standardized factor loadings of all items were above 0.6, with significant levels at $p < 0.001$, thus providing support for the individual indicator reliability (Dias et al., 2020). Internal consistency reliability was also validated, as all the constructs had Cronbach's alpha and Composite Reliability (CR) values exceeding the threshold of 0.7 (Dias et al., 2020), with a minimum of 0.9, suggesting a high level of internal consistency. Convergent validity was also supported by Average Variance Extracted (AVE) values from Table 2 surpassing the recommended threshold of 0.5 (Dias et al., 2020), ensuring that the variables explained a significant part of variance. Discriminant validity was evaluated using the Fornell and Larcker criterion, which stipulates that the square root of the AVE for a variable (presented on the diagonal in bold values in Table 2) must be greater than the highest correlation with any other construct (Fornell & Larcker, 1981). As shown in Table 2, this criterion is met for all variables except navigation.

The structural model was evaluated based on the sign, magnitude, and significance of the structural path coefficients, as well as the R^2 values for each endogenous variable, which serve as measures of the model's predictive accuracy. Furthermore, Stone-Geisser's Q^2 values were used to assess the model's predictive relevance (Hair et al., 2017). Prior to this evaluation, collinearity was checked, with Variance Inflation Factor (VIF) values ranging from 1.00 to 1.90, which is below the critical threshold of 5, indicating no collinearity issues (Hair et al., 2017). The coefficient of determination (R^2) for the two endogenous variables —satisfaction and purchase intention— were 59.6% and 62.7%, respectively. These values exceed the threshold of 10% established by Falk and Miller (1992). The Q^2 values for satisfaction and purchase intention were 0.52 and 0.48, respectively. Both were above zero, indicating the predictive relevance of the model.

Table 2 - Composite reliability, average variance extracted, correlations, and discriminant validity checks

Variables	α	ρ_c	AVE	(1)	(2)	(3)	(4)	(5)	(6)
(1) Aesthetic appeal	0.946	0.965	0.903	0.950	0.618	0.424	0.647	0.669	0.595
(2) Navigation	0.851	0.900	0.692	0.556	0.832	0.381	0.627	0.695	0.841
(3) Perceived ease of use	0.872	0.903	0.703	0.445	0.362	0.838	0.352	0.344	0.286
(4) Perceived usefulness	0.949	0.967	0.907	0.609	0.563	0.360	0.952	0.778	0.651
(5) Purchase intention	0.842	0.905	0.760	0.591	0.593	0.348	0.698	0.872	0.872
(6) Satisfaction	0.925	0.947	0.818	0.563	0.754	0.309	0.612	0.772	0.904

5. Results and discussion

The results in Table 3 suggest that the navigation of Smart Mirror technology has a significant impact on the customer's satisfaction with their experience ($\beta = 0.569$, $p < 0.001$), which supports H₄. Furthermore, data in Table 3 shows a less significant positive relation between the customer's perceived usefulness of this technology and their satisfaction with the retail experience ($\beta = 0.229$, $p < 0.05$), thus supporting H₂. Consequently, data suggests that the more satisfied a customer is with their experience, the higher their purchase intention is ($\beta = 0.772$, $p < 0.001$), meaning H₅ is supported.

Table 3 – Structural model assessment

Path	Path coefficient	Standard errors	t statistics	p values
Aesthetic Appeal → Satisfaction	0.122	0.092	1.325	0.185
Navigation → Satisfaction	0.569	0.095	5.965	0.000
Perceived ease of use → Satisfaction	-0.034	0.084	0.402	0.688
Perceived usefulness → Satisfaction	0.229	0.104	2.197	0.028
Satisfaction → Purchase intention	0.772	0.097	7.962	0.000

Table 4 indicates that satisfaction is the most significant factor affecting purchase intention with the importance value 0.772 and performance value 63.564, followed by navigation with importance value 0.439 and performance value 60.458. The perceived usefulness was the third most important factor with importance value 0.177 and performance value 58.901 suggesting that while it is relevant, its impact on purchase intention is far less pronounced than satisfaction and navigation. Contrarily, the aesthetic appeal and perceived ease of use have importance values that indicate a lower impact on purchase intention. These findings suggest that while visual and usability factors are important in making the user experience better, they do not significantly drive purchasing behavior compared to satisfaction and navigation.

Table 4 - Importance-performance map (IPMA) for Purchase intention (variables)

Variable	Purchase intention	Performance
Aesthetic Appeal	0.094	77.743
Navigation	0.439	60.458
Perceived ease of use	-0.026	74.074
Perceived usefulness	0.177	58.901
Satisfaction	0.772	63.564

Considering the most impactful factors, Table 5 showcases the most significant indicators used when measuring the variables. The most significant indicator was Satisfaction 4 (“Overall, I am satisfied with the outcome of using the Smart Mirror”), with the importance value 0.221 and performance value 67.143, followed by Satisfaction 1 (“Overall, I am pleased with the outcome of using the Smart Mirror”), 3 (“Overall, I am contented with the outcome of using the Smart Mirror”), and 2 (“Overall, I am happy with the outcome of using the Smart Mirror”) with the importance values 0.220, 0.217, and 0.195, and performance values 71.190, 58.333, and 54.524, respectively. The four indicators that follow all relate to navigation, and the most important indicator for this variable was Navigation 3 (“Using the Smart Mirror would allow me to navigate in the physical store”), with the importance value 0.154. Furthermore, and with less significance, we have the indicators related to perceived usefulness and aesthetic appeal. The main indicator for each construct is Perceived usefulness 1 (“I believe that using a Smart Mirror enables me to shop more efficiently”) and Aesthetic appeal 3 (“Using a Smart Mirror in apparel stores would be visually pleasing”), with importance values of 0.063 and 0.035, respectively.

Table 5 - Importance-performance map (IPMA) for Purchase intention (indicators)

Indicator	Purchase intention	Performance
Aesthetic Appeal 1	0.030	77.143
Aesthetic Appeal 2	0.034	78.095
Aesthetic Appeal 3	0.035	77.857
Navigation 1	0.121	70.952
Navigation 2	0.115	53.968
Navigation 3	0.154	60.952
Navigation 4	0.136	55.476
Perceived ease of use 1	-0.008	77.143
Perceived ease of use 2	-0.001	80.476
Perceived ease of use 3	-0.009	79.762
Perceived ease of use 4	-0.011	66.667
Perceived usefulness 1	0.063	62.381
Perceived usefulness 2	0.060	55.476
Perceived usefulness 3	0.062	58.810
Satisfaction 1	0.220	71.190
Satisfaction 2	0.195	54.524
Satisfaction 3	0.217	58.333
Satisfaction 4	0.221	67.143

The in-store experience is a key component of the luxury, as Luxury consumers look for personal satisfaction and an emotional dimension to their purchase (Cabigiosu, 2020), thus by adding emotional values to their luxury products, brands could increase their customers' purchase intentions (Dhaliwal et al., 2020). This emotional component is particularly crucial in the luxury sector, where consumers often seek experiences that surpass functional benefits, meaning luxury brands should focus on creating immersive, emotionally engaging experiences, both in-store and online.

This research suggests that the variable that has the most significant influence on consumers' purchase intention is satisfaction, namely their satisfaction with the purchasing experience. In other words, customers that are satisfied with their experience in a luxury brand's retail space are more likely to follow with an actual purchase of a luxury good. This supports previous research that suggested that satisfaction can explain purchase intention (Alavi et al., 2016; Ciornea, 2013). However, it contradicts a previous study which suggested that satisfaction did not have a significant influence on the company's sales (Carpenter, 2008). However, one should note that this study was made considering the discount retail sector. Luxury retail often prioritizes creating a premium and personalized shopping experience, where customer satisfaction is closely linked to the brand's value proposition. In contrast, the discount retail sector is more likely to prioritize cost and efficiency over experiential satisfaction, leading to a weaker link between satisfaction and sales. Therefore, the context of the retail environment appears to be a crucial factor in understanding the impact of satisfaction on purchase intention.

Additionally, navigation was revealed to be an important predictor of customers' satisfaction with their experience using Smart Mirror technology. Companies should make efforts to incorporate Smart Mirrors in their retail spaces with an effective and not too complex navigation system so that their customers can interact with the technology in a seamless manner. This supports previous research that found ease of navigation was a key feature of VR applications (Loureiro et al., 2018). Later, Castillo and Bigne (2021) marked navigation through technology as a relevant predictor of perceived usefulness, adding that AR and VR technologies have the potential to improve the customer's experience in-store using harmonious navigation. The study's findings extend this understanding by suggesting that, in a luxury retail setting, smooth and intuitive navigation may be a key component of the retail experience, as customers expect a smooth,

premium experience that aligns with the brand's high-end positioning. Therefore, careful attention to navigation design may not only increase satisfaction, but also reinforce the brand's overall value in a luxury context.

This study did not find a significant relationship between the aesthetic appeal of the Smart Mirror technology and customers' satisfaction with their retail experience. This contrasts with prior research, which has highlighted the importance of aesthetics in shaping customer perceptions and experiences. For instance, Park et al. (2021) identified aesthetic appeal as a strong predictor of consumer attitudes, focusing on its pivotal role in the in-store experience. Similarly, Tzou and Lu (2009) validated that perceived aesthetics significantly influenced customer acceptance of a technology, with beauty significantly contributing to the customer's shopping pleasure.

Finally, this study's findings align with previous research on the impact of perceived usefulness in shaping customers' retail experiences. In this study, perceived usefulness was shown to have a positive influence on customer satisfaction with Smart Mirror technology, as well as their overall in-store experience. This is consistent with Castillo and Bigne's (2021) results, which demonstrated that perceived usefulness positively affects customers' attitudes towards AR-based self-service technologies. However, the results diverge from those of Tzou and Lu (2009), who found that neither perceived usefulness nor perceived ease of use significantly predicted customers' intention to use the technology, despite identifying a positive link between perceived ease of use and customer pleasure.

6. Implications and recommendations

6.1. Academic implications

This research adds to the existing literature on luxury retail and its digitalization, specifically by analyzing Smart Mirrors' role in influencing the customer's shopping experience and satisfaction in high-end retail settings.

The study builds upon the TAM, and it incorporates aesthetic appeal and navigation as additional mediators. Thus, it expands the original framework focused mostly on perceived ease of use and perceived usefulness, providing a more tailored approach to understanding luxury consumers' acceptance of the Smart Mirror, as it highlights the importance of design and user interface in luxury retail.

The study's findings identify navigation as the most significant factor influencing satisfaction in Smart Mirror use, emphasizing that luxury consumers value seamless interactions with technology. Therefore, future TAM-based research could set navigation as a core component of technology acceptance, especially when studying luxury consumers who expect a hedonic experience. Furthermore, perceived usefulness was also identified as a mediator for customer satisfaction, confirming its role within the original TAM framework. However, in luxury retail, usefulness must extend further than traditional functionality, as technology should be integrated to enhance the luxury feeling and experience.

This study's findings offer new insights into how luxury consumers obtain satisfaction from not just products, but also the retail experience itself, including the technologies they interact with. The inclusion of aesthetic appeal as a mediator in the model emphasizes the role that design plays in technology adoption within luxury fashion retail, creating a pathway for future research to explore the role of aesthetics in other retail segments, for example. Also, future research on luxury consumer behavior should continue to consider how technological features, aesthetics, and ease of navigation influence satisfaction with the shopping experience and consequent purchase intention.

Lastly, this study examines how satisfaction mediates the relationship between different variables (ease of use, usefulness, aesthetic appeal, and navigation) and purchase intention, which contributes to understanding consumer decision-making in luxury contexts. Future research should

continue to explore these complex relationships, as consumer behavior in luxury retail is driven by a combination of factors, such as emotional, psychological, and functional.

6.2. Practical implications

To increase customer satisfaction and subsequently purchase intentions, luxury retailers may integrate technologies like Smart Mirrors into their retail spaces, ensuring that these innovations deliver clear and tangible benefits to customers. This study suggests that perceived usefulness has some positive influence on customer satisfaction, thus highlighting the importance of improving the functionality of Smart Mirrors. Retailers should then prioritize features that offer practical benefits, such as virtual try-ons with more visual accuracy, the possibility to connect with other sales assistants or personal shoppers for advice, translation services, or even showcasing content related to the process and craftsmanship behind some pieces selected by the customer. Consequently, retailers can increase customer satisfaction by promoting interaction with Smart Mirrors and making it a part of the customer journey.

Additionally, the ease of navigation through Smart Mirrors plays a crucial role in shaping customer satisfaction. Customers may expect an intuitive and seamless experience in luxury environments (Harba, 2019), which means that too complex or confusing interfaces could negatively impact their perception of the experience and the brand. Therefore, retailers must ensure that Smart Mirrors are user-friendly and intuitive, allowing customers to navigate the store using the technology. Moreover, luxury fashion brands should focus on providing training for sales staff on how to assist customers with Smart Mirrors in a way that improves the overall experience.

The research further indicates that customer satisfaction with Smart Mirrors positively influences customers' purchase intentions, emphasizing the relevance of brands creating pleasing retail experiences for their customers. These can be supported by technology, and retailers should focus on seamlessly integrating Smart Mirrors into the overall store environment, ideally merging digital interactions with the traditional support from sales assistants. The mixed approach helps preserve the personal touch that is quintessential to luxury retail while taking advantage of the benefits of technology to enhance the customer retail experience.

In conclusion, integrating Smart Mirrors that offer clear benefits and feel intuitive to navigate into luxury retail spaces could be a promising way for brands to deliver value to the

customer and increase their satisfaction. Training sales staff to effectively support Smart Mirror interactions is a necessity, as this mixed interaction should contribute to the enrichment of the shopping experience.

7. Limitations and further research

While this study provides insights into the impact of Smart Mirror technologies on luxury fashion retail spaces and customer purchase intentions, some limitations should be acknowledged, along with opportunities for future research to address them.

Firstly, the data for this study was collected from participants who did not physically interact with the Smart Mirror, but instead watched a video showcasing the technology. This indirect experience may have affected their perceptions and responses, as actual interactions with the technology in the retail space could evoke different reactions. Future research should focus on collecting data from individuals who have physically engaged with Smart Mirrors in luxury fashion retail environments. This would allow for a more precise understanding of how customers behave when using the technology in real-world scenarios.

Second, the paper focuses exclusively on the luxury fashion segment, which limits the applicability of the findings to different market segments. The results observed in a luxury context may not translate to fast fashion or other retail sectors, where consumer expectations and behaviors may differ significantly. Future research could explore how Smart Mirrors impact the customer's experience and purchase intentions in other market segments, as broadening the scope could provide useful insights into how the adoption of technologies like this varies across different types of market segments.

Lastly, this study specifically examines Smart Mirrors as the primary technology of interest, offering a restricted view of how other emerging technologies could impact customer satisfaction and purchase behavior in retail spaces. Future studies could extend the scope by investigating the effects of a wider range of technologies and how these impact the luxury retail experience, such as AI-driven sales assistants.

To summarize, this study highlights the significant role that Smart Mirror technologies can play in improving customer satisfaction and driving purchase intentions within luxury fashion retail spaces. However, further research is needed to address some limitations of this study, particularly by incorporating real-world interactions with the technology and exploring broader retail segments and technologies. As the retail industry continues to evolve technologically, understanding the effects of these innovations will be critical for retailers aiming to meet rising consumer expectations.

8. Conclusion

This study aimed to assess the impact of Smart Mirror technology on the retail experience within the luxury fashion industry, focusing on how it influences customer satisfaction and, consequently, their purchasing behavior. The research was built around three core objectives: to understand the specificities of luxury fashion retail and its digitalization; to evaluate how Smart Mirrors affect the in-store customer experience; and to analyze the role this technology plays in customers' purchasing decisions.

The analysis revealed important insights into the factors driving customer satisfaction and purchase intention when using Smart Mirrors. Specifically, it was found that navigation had a strong impact on satisfaction, playing a crucial role in improving customer interaction with Smart Mirrors and overall experience. Additionally, perceived usefulness was shown to have some influence on satisfaction as well, suggesting that customers are more likely to be satisfied with the technology if they consider it to be useful when shopping. Furthermore, aesthetic appeal demonstrated a not so strong influence on customer satisfaction, despite being traditionally viewed as important in luxury settings (Park et al., 2021). These results indicate that, while aesthetics remain important, functionality is a more significant driver of satisfaction in this context. Specifically, respondents valued the sense of navigating through the physical store using the Smart Mirror the most, as presented in Table 5 within indicator Navigation 3.

This study contributes to the existing literature on technology adoption in luxury retail, particularly within the framework of the TAM. The findings support the idea that navigation and perceived usefulness are the main factors influencing customer satisfaction, aligning with existing research on the importance of planned technology integration in enhancing the retail experience (Castillo & Bigne, 2021). However, the study contrasts with previous research about the role of aesthetics (Park, Ha, & Jeong, 2021), as aesthetic appeal was found to have a minimal impact on satisfaction. These results suggest that, while aesthetics may contribute to the perceived quality of the overall environment, their role in driving customer satisfaction can be secondary to the more practical purpose of technology.

For luxury fashion retailers, the insights from this study highlight the importance of integrating Smart Mirrors in a way that prioritizes functionality and ease of navigation. The research shows that customers value technologies that are not only visually appealing, but also

useful. Thus, brands should focus on designing Smart Mirror interfaces that are intuitive and user-friendly, allowing customers to effortlessly navigate through their store.

While this study provides insights into the impact of Smart Mirrors in luxury retail, there are some limitations to consider. The data for the research was collected from respondents who did not interact with the Smart Mirror, which may limit the accuracy of their perceptions and feedback. Additionally, the research was conducted within a specific sector, which could impact the applicability of the results across different market segments. Future research should aim to broaden the scope by examining the use of similar technologies in other contexts to provide a more comprehensive understanding of their impact. Another potential direction would be to explore the impact of other emerging technologies, such as AI-driven sales assistants, on the luxury shopping experience. Additionally, inquiring people after physically interacting with in-store technology could be a step further for future research. Finally, it could also be insightful to investigate the role of customer demographics in moderating the impact of these technologies, particularly in relation to age and digital literacy.

As technology continues to reshape the luxury retail landscape, brands must adapt to meet the increasing expectations of their consumers. Smart Mirrors represent a key innovation that has the potential to boost the in-store experience by offering personalization, convenience, and immersiveness. Brands that successfully incorporate this technology into physical stores may increase their customer satisfaction and sales and, going forward, the integration of technologies like Smart Mirrors will be essential for maintaining a competitive edge within the luxury market, where experience is key.

9. Bibliography

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10. Annexes

10.1. Instrument development

Variable	Adapted from
Perceived ease of use	Tzou and Lu (2009)
Perceived usefulness	Tzou and Lu (2009)
Aesthetic appeal	Park et al. (2021)
Navigation	Castillo and Bigne (2021)
Satisfaction	Carpenter (2008)
Purchase intention	Riedel and Mulcahy (2019)

10.2. Measurement indicators for the conceptual model's variables

Perceived ease of use	<ul style="list-style-type: none">- As minhas interações com o Smart Mirror em lojas de vestuário seriam claras e compreensíveis.- Interagir com o Smart Mirror em lojas de vestuário não exigiria muito esforço mental- Eu consideraria o Smart Mirror em lojas de vestuário fácil de usar- Eu consideraria fácil fazer com que o Smart Mirror numa loja de vestuário fizesse o que eu pretendesse
Perceived usefulness	<ul style="list-style-type: none">- Usar o Smart Mirror em lojas de vestuário melhoraria o meu desempenho no processo de compras- Usar o Smart Mirror em lojas de vestuário aumentaria a minha produtividade- Usar o Smart Mirror em lojas de vestuário aumentaria a eficácia nas compras
Aesthetic appeal	<ul style="list-style-type: none">- O Smart Mirror em lojas de vestuário apela-me visualmente- As interações com o Smart Mirror em lojas de vestuário são esteticamente apelativas- Utilizar o Smart Mirror em lojas de vestuário seria visualmente agradável
Navigation	<ul style="list-style-type: none">- Usar o Smart Mirror fornecer-me-ia flexibilidade para encontrar informações na loja- Usar o Smart Mirror oferecer-me-ia um ambiente muito livre no qual eu poderia navegar como achasse melhor

	<ul style="list-style-type: none"> - Usar o Smart Mirror permitir-me-ia navegar na loja física - Usar o Smart Mirror permitir-me-ia mover-me livremente na loja física
Satisfaction	<ul style="list-style-type: none"> - Ficaria satisfeito/a com o resultado do uso desta tecnologia - Ficaria feliz com o resultado do uso desta tecnologia - Ficaria contente com o resultado do uso desta tecnologia - No geral, ficaria satisfeito com o resultado do uso desta tecnologia
Purchase intention	<ul style="list-style-type: none"> - Teria intenções de comprar um produto utilizando a tecnologia Smart Mirror - Usarei a tecnologia Smart Mirror quando for às compras [considerando a tecnologia disponível] - Recomendaria a tecnologia Smart Mirror a outras pessoas